

# *Market Segmentation in Higher Education: A Case Study*

by  
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A survey of applicants accepted to a major research university who chose to enroll elsewhere revealed that the respondents generally were motivated by noneconomic considerations. Among the most sought-after applicants, however, academic scholarships and other forms of financial aid were more likely to have influenced the applicants' college choice process, putting the institution with minimal non-need-based financial aid at a competitive disadvantage.

## *Introduction*

Colleges and universities, being essentially meritocracies, have for many years sought to enhance their individual institutional milieus by seeking and enrolling the best qualified students possible. Even open admissions institutions make substantial efforts in searching for "diamonds in the rough" who show academic promise. Selective institutions frequently go to greater lengths to enhance their applicant pools, in order to have a substantial number of well qualified applicants from which to choose.

An issue of interest to selective and open admissions institutions alike is why students who are offered admission do not attend. Of special interest to the selective institution continually seeking to enroll academically superior students is why the best qualified applicants admitted do not attend. The following summarizes an attempt by one selective research university, Virginia Tech, to determine why applicants accepted for admission chose not to attend the university. In studying the topic, data were gathered which raise questions about the proper net pricing strategy for the university in its segment of the higher education market.

## *Literature Review*

The literature of higher education has adopted many marketing terms in recent years, as the decline in high school graduates has sent colleges and universities scrambling to maintain enrollment and student quality levels. One of the early leaders in bringing not-for-profit organizations together with marketing terminology and techniques is Kotler (1975), whose work remains a standard reference in the area. Ihlanfeldt (1980) is more specific to the college selection process, including the effect of financial aid practices on college choice, while Nelson and Fenske (1983) offer some insights into the difficulties involved in trying to coordinate an aggressive admissions recruitment strategy with an impartial student financial aid policy.

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Utilizing such marketing concepts as market segmentation (an institution's market niche among other colleges and universities) and pricing, a number of researchers have determined that market sectors tend to overlap minimally, if at all. For instance, Zemsky and Oedel (1983) came to the conclusion that the range of institutions considered by a potential college student is largely determined by the applicant's socioeconomic status. The end result is that, in general, private institutions compete with other, similar private institutions for a percentage of the student pool. Likewise public institutions compete with other publics, most often of similar type, e.g., residential university vs. residential university, residential comprehensive college vs. residential comprehensive college, and community college vs. commuter comprehensive college or commuter vocational school. Some "shopping up" or "trading up" does occur in that students sometimes seek to enroll at the most prestigious institution, but even then the competition is within market sector rather than across sectors.

Tierney (1983) likewise makes the point that the institutional selection process is a later stage, following an earlier process of market sector selection, and that "this initial screening of colleges takes place long before students know whether or not they have been admitted, much less the amount of financial aid they might be offered." Chapman and Jackson (1984) reached similar conclusions about the effects of perceived cost (i.e., gross tuition and other costs) on college selection. They also found evidence of "academic quality zoning," in that individual colleges tend to attract students with a certain range of academic abilities that matches their own. In short, students seek out institutions that seem comfortable to them academically as well as socioeconomically. Even when attempting to be admitted to what is perceived to be a prestigious institution, students seek one that is within the range of their own personal comfort zone.

The competitive pricing issue for a selective public university such as Virginia Tech is therefore one of competing with other selective public universities in the Commonwealth. In fact, a number of states have also entered the fray by offering academic scholarships that can be used only within the state (Jaschik, 1987). The access vs. choice debate offers little of relevance here, unless choice is defined as choice between public institutions within a state, as opposed to the traditional private-public distinction. Access to higher education as such does not apply as an issue here, since higher ability students are also better off financially on average and attend the more expensive institutions within the public sector (Leslie, 1984).

The competitive pricing issue then becomes to what extent student financial aid, especially that based on academic or other merit, affects student choice behavior within an institution's market segment. As at least two studies have shown, no-need or merit-based scholarships do have a small but statistically significant effect upon students deciding between institutions of similar perceived academic quality (Chapman and Jackson, 1984; Zelenak and Cockriel, 1986). To the college or university involved, the policy issue is to what extent the institution is willing to go to remain competitive with its peers in attracting the most scholarly students by offering merit or no-need financial aid as opposed to need-based aid.

Put in marketing terms, how much should an institution of higher education "discount" its "price" or tuition by offering non-need-based aid? A related issue is that of educational loans for, as Elliott (1980) points out, educational loans constitute a form of consumer credit, while scholarship or gift aid is analogous to a cash discount. The danger, of course, is that too much price competition for the best students can set off a price war that ultimately will be detrimental to the fiscal and academic health of the institutions (Jenny, 1983; Haines, 1984). Ignoring the trend will not make it go away, however, and may cost a college or university its best applicants.

### *Methodology*

As part of the effort to determine why accepted applicants chose not to attend Virginia Tech, a mail survey was conducted during the Fall Quarter, 1985. A total of 4,571 questionnaires was sent to those new freshmen applicants accepted for admission in the Fall, but choosing not to enroll at Tech. As of January 3, 1986, responses were received from 2,296 of those receiving questionnaires, for a response rate of approximately 50 percent.

The survey form consisted of 21 questions, the first 18 of which had to do with reasons for not attending the university. A factor analysis was performed on the first 18 questions, and this yielded 5 groupings of types of responses. Below is a listing of all of the 21 questions, with the first 18 grouped in the five categories suggested by the results of the factor analysis. The number before each question corresponds to that assigned on the original survey form.

#### Major/Reputation Related

- 2. Not admitted in my first choice major.
- 3. Admitted to the college that was my first choice.
- 11. Quality of major.
- 14. Plan to transfer to Virginia Tech from another college.
- 16. Reputation of the college.

#### Financial Related

- 7. Received an academic scholarship from another college.
- 8. Received better financial aid from another college.
- 9. Received no financial aid from Virginia Tech.
- 12. Honors program.

#### Size Related

- 4. Desire a smaller college.
- 13. Faculty/Student ratio.

#### Social/Convenience Related

- 1. Chose a college closer to my home.
- 5. Friends attending another college.
- 6. Lower tuition rates at another college.
- 10. Geographic location of the college.

#### Other Reasons for Not Attending

- 15. Study Abroad program.
- 17. Will work before entering college.
- 18. Other: \_\_\_\_\_.

#### Other Questions

- 19. Did you make a visit to our campus (Y/N)?
- 20. Are you attending another college (Y/N)?
- 21. Name of college \_\_\_\_\_.

The four factor solution (common factor analysis with orthogonal rotation)<sup>1</sup> shown above was employed because its results seemed to group the questions in the most meaningful way conceptually. The fifth category of "Other Reasons" is simply a catch-all for those questions not having factor loadings above the .20 level.

Several issues arise out of the factor analysis results. The fact that lower tuition loaded more heavily on the social/convenience scale than on the financial aid one suggests that tuition levels are counted as part of the decision to commute or reside on campus, rather than being considered as primarily financial aid related. In other words, tuition level concerns as perceived by the applicants, most of whom attended other state-supported universities in Virginia, were more likely to correspond to questions relating to residence than to questions concerning financial aid. The grouping of honors students among the financial aid concerns is not so easily explained, unless this group represents those academically gifted students who were attracted elsewhere by a combination of academic scholarships and honors courses.

Another interesting point about the factor loadings is the direction of the signs. Those not attending due to not being accepted into the major of their choice, as well as those planning to transfer to Tech, loaded on the major/reputation dimension with a negative sign. The negative loading suggests that their reasons for not attending are academic based, but quite different from those going elsewhere for perceived quality and reputational reasons.

The ability to categorize the responses by using the results of the factor analysis puts the responses to the questions into a broader context. As shown below, there was wide variation as to the most frequently mentioned reasons for not attending Tech. The mean number of responses per person was 3.16.

Table 1

Ten Most Common Reasons Given by Respondents  
for Not Attending Virginia Tech  
Fall, 1985

<u>Rank</u>	<u>Reason</u>	<u>Responses</u>
1.	Admitted to first choice college.	1,162
2.	Chose college closer to home.	901
3.	Desire smaller college.	739
4.	Reputation of (other) college.	595
5.	Quality of major.	521
6.	Geographic location of college.	482
7.	Faculty/Student ratio.	465
8.	Other: _____	456
9.	Received academic scholarship elsewhere.	368
10.	Received no financial aid from Virginia Tech.	294

*Notes*

<sup>1</sup> Factor analysis is a statistical technique which allows the researcher to examine the underlying patterns or relationships among a large number of variables, in order to suggest ways in which the data can be summarized into a smaller set of factors or components. In this case 21 individual questions were collapsed into six categories through the use of factor analysis. For a readable explanation of factor analysis aimed at the nonstatistician, see Hair, Anderson, and Tatham (1987, pp. 233-293).

It can be seen from Table 1 that the first seven reasons cited most often for not attending Virginia Tech are major/reputation related, size related, or social/convenience related. The size and social/convenience issues are generally beyond the control of the university, except in cases where incorrect information has led to erroneous perceptions. Likewise the major/reputation category relies on perceptions of academic quality and status which are difficult for the university to influence very quickly, though improved information might gradually shift applicants' perceptions.

The eighth most popular reason for not attending the university is the catch-all "other" category, which includes a variety of reasons covering the other categories. The ninth and tenth most-cited reasons are financial aid in nature, making them potentially capable of being influenced by university actions.

Since multiple responses were permitted in responding to the questionnaire, further analysis was done as to the response of "Admitted to the college that was my first choice." The reasoning is that, for those who did not choose another institution necessarily because it was their first choice, they may have actually preferred to attend Virginia Tech. At worst this group was more open to the possibility of attending Tech than the group which had a clear other first choice.

Table 2 shows that the rank ordering of reasons does change when those noting another institution as their first choice are excluded. The "other" category jumps from eighth to third, and academic scholarships move from ninth to fourth in order of importance. The remaining reasons stay nearly the same or decline in ranking. Statistical tests using chi-square and correlation also show significant and strong relationships between being open to Tech as a first choice and (1) other reasons, (2) student financial aid, and (3) lower tuition. Sensitivity to net costs of college attendance appears to separate this group of respondents from those choosing another institution as a first choice.

Table 2  
Ten Most Common Reasons Given by Respondents  
for Not Attending Virginia Tech  
(First Choice College Respondents Excluded)  
Fall, 1985

<u>Rank</u>	<u>Reason</u>	<u>Responses</u>
1.	Chose college closer to home.	515
2.	Desire smaller college.	361
3.	Other _____.	299
4.	Received academic scholarship elsewhere.	240
5.	Faculty/Student ratio.	233
6.	Quality of major.	211
7.	Reputation of (other) college.	203
8.	Geographic location of college.	200
9.	Received no financial aid from Virginia Tech.	199
10.	Lower tuition elsewhere.	194

The most common category of response among those listing "other" reasons was financial in nature, followed by major/reputation, social, and size related reasons. Two other types of complaints were impersonal administration/late admission decision (15 respondents) and applicants desiring ROTC but not wanting to be in the

Corps of Cadets (13 respondents).

The academic characteristics of the respondents varied by their reasons for not attending the university, as shown in Table 3. Those offering financial reasons had the best high school grade averages, class ranks and SAT scores, followed by those offering major/reputation reasons. The social/convenience group was less strong academically, and those offering institutional size reasons were the least prepared as a group. This finding suggests that many of the respondents in the group offering financial reasons for not attending Tech may well have been attracted away to another institution of higher education by academic scholarships.

Table 3  
Mean Scores of Respondents\*  
by Reason for Not Attending Virginia Tech  
Fall, 1985

	SAT Combined	Grade Point Ave.	H.S. Class Rank
<u>Major/Reputation Related</u>			
2. Not admitted to major desired. (193)	1067	3.25	20/100
3. Admitted to first choice coll. (1,162)	1158	3.45	13/100
11. Quality of major. (522)	1169	3.47	13/100
16. Reputation of the college. (595)	1183	3.51	12/100
<u>Financial Related</u>			
7. Received academic scholarship. (368)	1203	3.59	8/100
8. Received better financial aid. (261)	1168	3.53	10/100
9. Received no fin. aid from Tech. (294)	1132	3.40	13/100
<u>Size Related</u>			
4. Desire smaller college. (739)	1109	3.35	16/100
13. Faculty/Student ratio. (465)	1112	3.36	16/100
<u>Social/Convenience Related</u>			
1. Choose college closer to home. (901)	1124	3.40	14/100
5. Friends attending elsewhere. (140)	1115	3.37	15/100
6. Lower tuition elsewhere. (271)	1112	3.38	14/100
10. Geographic location of college. (482)	1145	3.44	15/100
<u>Other Reasons</u>			
12. Honors program. (87)	1279	3.70	7/100
14. Plan to transfer to Tech. (169)	1036	3.23	17/100
15. Study Abroad program. (67)	1151	3.46	16/100
17. Will work before entering coll. (34)	1057	3.20	18/100
18. Other: _____. (456)	1138	3.37	15/100
Average All Respondents (2,296)	1137	3.41	14/100
Average New Freshmen (4,163)	1089	3.26	19/100
National Average New Freshmen	906		

\*Figures in parentheses denote number of respondents.

Among those whom Virginia Tech is trying particularly hard to recruit are academically qualified Black high school graduates, so the responses of the Black and other applicants were separated in order to see what, if any, differences existed between the responses of the two groups. The most common responses for Black and Non-Black applicants accepted to but not attending the university are noted in Table 4. Those questions which Blacks mentioned more frequently than Non-Blacks ( $p < .05$ ) are highlighted by an asterisk next to the ranking given that reason by Black respondents. An examination of Table 5 reveals that three of the four highlighted reasons are financial in nature, while the fourth is academic. (Within the "Other" category, the most frequently cited reason is also financial). On the 15 questions not highlighted, Blacks and Non-Blacks offered similar reasons for not attending Virginia Tech.

Table 4

Ten Most Common Reasons Given by Black and Non-Black  
Respondents for Not Attending Virginia Tech  
Fall, 1985

Reason	(N = 84)		(N = 2,212)	
	Black Resps.	Black Rank	Non- Black Resps.	Non- Black Rank
Admitted to first choice college.	38	1	1,124	1
Chose college closer to home.	28	2	873	2
Received academic scholarship elsewhere.	26	3*	342	9
Received better financial aid elsewhere.	23	4*	238	12
Desire smaller college.	19	5	720	3
Reputation of (other) college.	19	5	576	4
Quality of major.	18	7	503	5
Received no financial aid from Tech.	18	7*	276	10
Other: _____	15	9	441	8
Not admitted to first choice major.	14	10*	179	13

\*Rank significantly different from that of Non-Blacks ( $p < .05$ ).

Further analysis of the four questions on which Black and Non-Black response patterns differed suggests that the academic credentials of the Blacks responding varies, as seen in Table 5. Those listing financial aid reasons for not attending the university have, on average, better academic credentials than those denied entrance into a first choice major. However, the small number of respondents, as well as missing academic data for some of the respondents, distort the data somewhat and thereby limit their interpretability.

Table 5

Reasons Given by Black Respondents  
for not Attending Virginia Tech  
by Academic Credentials  
(Significant at the .05 Level)  
Fall, 1985

	SAT Combined	Grade Point Ave.	H.S. Class Rank
Received academic scholarship elsewhere. (26)	1018	3.17	16/100
Received better financial aid elsewhere. (23)	939	3.24	13/100
Received no financial aid from Tech. (18)	934	2.09	20/100
Not admitted to first choice major. (14)	926	3.27	33/100
Total Black Respondents (84)	945	3.00	25/100

A natural concern at Virginia Tech is the eventual institutional destination of those students, Black and otherwise, not attending the University. As Table 6 shows, the vast majority of those not enrolling at Tech are attending the other, selective, state-supported institutions in Virginia (i.e., the University of Virginia, the College of William and Mary, or James Madison University); most of these students are Virginia residents. Among those going to college out-of-state, the majority are matriculating in their states of residence, having applied to Tech as out-of-state students. The academic credentials of those not enrolling at Virginia Tech demonstrate that they are, in general, the kinds of academically well qualified students that the university would like to enroll.

Table 6

Academic Credentials of All Respondents  
By Individual Institutions of Higher Education Attended  
Fall, 1985

	SAT Combined	Grade Point Ave.	H.S. Class Rank
University of Virginia (319)	1192	3.60	9/100
James Madison University (282)	1081	3.27	10/100
College of William and Mary (80)	1181	3.48	13/100
Pennsylvania State University (80)	1180	3.58	10/100
Old Dominion University (62)	1057	3.18	18/100
North Carolina State University (59)	1131	3.39	16/100
George Mason University (51)	1039	3.23	24/100
Mary Washington University (49)	1030	3.18	25/100
Georgia Tech (49)	1214	3.56	11/100
University of Maryland (45)	1172	3.56	9/100
Virginia Tech	1089	3.26	19/100



### Conclusions

The results of the survey of students who were offered admission to Virginia Tech, but who chose not to attend, shows that they generally tended to go to college elsewhere rather than forego college even temporarily. Several sub-groups of respondents emerged, each exhibiting different enrollment patterns.

Out-of-state students usually chose to attend major research universities in their home states with academic program offerings similar to Tech's; the lower in-state tuition levels can be assumed to contribute to such decisions. The most academically qualified Virginia residents favored the other selective state-supported institutions, i.e., the University of Virginia, the College of William and Mary, and James Madison University, for academic and reputational reasons. The students attending the other state universities were more interested in size and convenience factors and were generally not as strong academically, though obviously qualified in that they were offered admission to Tech in the first place.

Among those students not stating that they were attending their first choice institution, academic scholarships and other financial reasons ranked among the top 10 reasons offered, with the best students rating them particularly high. Likewise, Black students tended to offer better financial aid elsewhere, including academic scholarships, as major factors in their decisions not to attend Virginia Tech. Both groups represent potential for improved recruiting, especially when one focuses on the best academically prepared students.

The research reported here summarizes the results of a single market research study done at one institution only, but it offers an example of how such techniques can be applied to investigate an important issue in higher education finance. While the results are quite specific, the methodology can be adjusted to local circumstances and utilized in a wide variety of settings.

The primary question for the institution that grows out of this kind of market research is to what extent it is being competitive with its sister colleges or universities in recruiting the best and brightest students. That some excellent students are being lost to other institutions, often attracted by financial inducements, is verified by the responses in this case. What is not known is how many current students represent those attracted away from other institutions.

The danger to the university is in not keeping up with the competition, thereby enrolling only those who are good enough to be admitted, but not quite good enough to get academic scholarship aid elsewhere. Beyond all the rhetoric about need-based aid versus non-need-based aid is a simple fact of life: acting substantially different from one's peer institutions risks one's competitiveness for the most sought-after students. Only by a thorough investigation of current scholarship programs can the university determine to what extent a commitment to need-based aid should co-exist with a commitment to academic excellence and competitiveness.

The dilemma that presents itself to a major research university which does not offer substantial amounts of merit-based student financial aid can best be illustrated by the following paraphrase of a letter of response from the mother of one of the students surveyed.

My husband is a graduate of Virginia Tech, and I attended Radford [formerly the sister school of Virginia Tech, when each was a single-sex institution]. My son grew up hearing about how wonderful Virginia Tech is. He graduated from high school last year as a National Merit Scholar and was admitted to all five universities to which he applied. *Yours was the only one which did not offer him financial aid.* We were all disappointed. He is now attending another university on a full academic scholarship.

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